7 Taiharuru

Description and geomorphology

Taiharuru Bay is located on the east coast of Northland, approximately 19 km east of Whangarei.

The site is an east facing pocket beach embayment situated between the two headlands of Waipuna Point in the north and Huitau Point in the south. Both headlands comprise of Greywacke rock.

The relatively low lying central dune area is approximately 190 m long and is developed with the most seaward dwelling located 8 m from the dune toe.

The site has a mixed coarse sand and gravel beach, with a high portion of pebble material above the high tide line. The central section of the beach has a 20 m wide berm above the high tide line. The site has no high tide berm at both the northern and southern cliff end sections of the bay.

The central beach section has a typical profile that transitions from a grass bank down to the berm with a revetment that is approximately 2 m high. The backshore elevation ranges from RL 4 m to 5 m.

Local considerations

There is a rock revetment located along the 190 m long central section of the site. A boat ramp is situated at the southern end of the revetment.

The topography rises up to a headland on either side of the central beach area. The southern cliff consists of highly weathered Greywacke, with an actively eroding cliff face. The cliff elevation at this ranges from 17 to 23 m. The northern cliff shoreline is moderately strong Greywacke with an elevation of approximately 18 to 30 m.

Coastal Erosion Hazard Assessment

The site is split into three cells based on differences in geomorphology, exposure and cliff/dune height.

Adopted component values are presented within Table 7-1. While the cliffs at either end are both relatively high (18-30 m), the rock at the southern end is more highly weathered and so has a low stable angle of repose. Both cliffs are retreating at rates up to 0.2 m/year.

Site Photograph A (North cliff shoreline)

Site Photograph B (centre)

Site Photograph C (south cliff shoreline)

Histograms of individual components and resultant CEHZ distances using a Monte Carlo technique are shown in Figure 7-2. Coastal Erosion Hazard Zone widths are presented within Table 7-2 to 7-4 and Figure 7-4.

Future shoreline distances range from 8 to 9 m for cliffs to 2080 with CEHZ1 of 28 m for the beach cell. 2130 shoreline distances range from 24 to 34 m for cliffs, CEHZ2 and CEHZ3 for the beach cell are 58 and 70 m respectively. The CEHZ's have been mapped in agreement with the calculated values

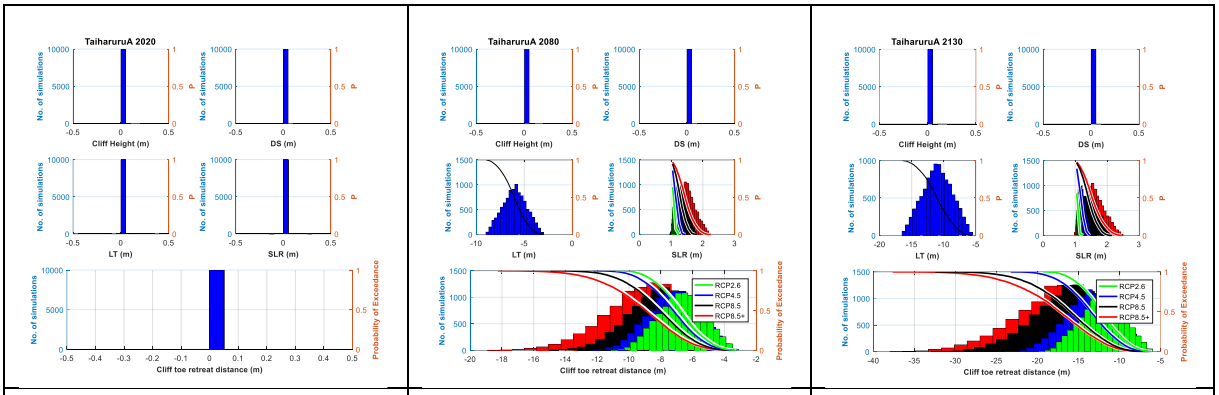
For cell 7A and cell 7C the cliff projection method has been adopted with future shoreline distances shown in Figure 7-1, Figure 7-3, Table 7-3 and 7-4 instead of CEHZ distances.

Figure 7-5 shows the available historic shorelines for Taiharuru.

Table 7-1 Component values for Erosion Hazard Assessment

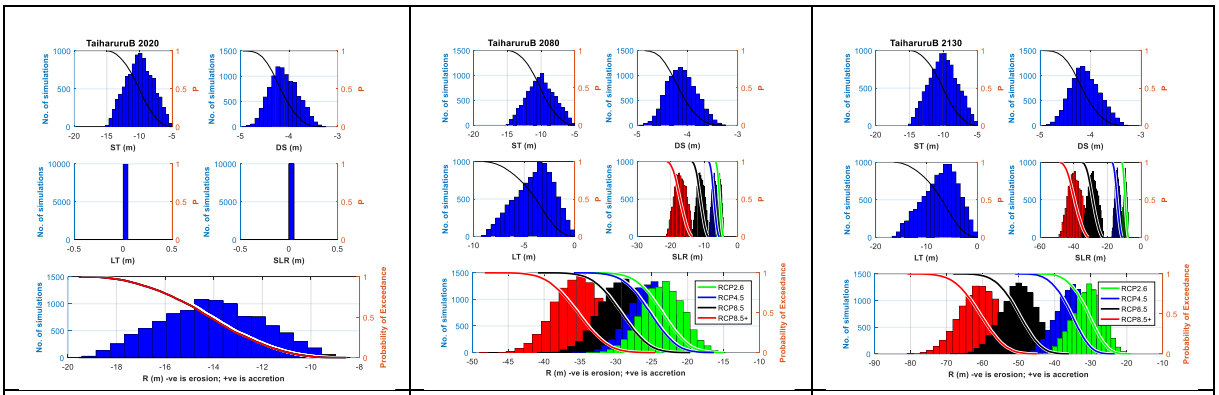
Site		**7. Taiharuru**		
Cell		7A[1]	7B[2]	7C[1]
Cell centre (NZTM)	E	1740449	1740368	1740482
	N	6045171	6044960	6044787
Chainage, m (from N/W)		0-500	500-700	700-1000
Morphology		Greywacke	Dune	Greywacke
Short-term (m)	Min	0	5	0
	Mode	0	10	0
	Max	0	15	0
Dune/Cliff elevation (m above toe or scarp)	Min	18.0	4.3	17.0
	Mode	23.5	5.3	19.2
	Max	29.9	5.8	22.9
Stable angle (deg)	Min	26.6	30	14
	Mode	30.2	32	16.2
	Max	33.7	34	18.4
Long-term (m) -ve erosion +ve accretion	Min	-0.05	0	-0.05
	Mode	-0.1	-0.05	-0.1
	Max	-0.15	-0.15	-0.2
Closure slope (beaches)	Min	0.5	0.038	0.75
	Mode	0.25	0.028	0.5
	Max	0	0.024	0.25
SLR 2080 (m)	RCP 2.6	0.16	0.16	0.16
	RCP 4.5	0.21	0.21	0.21
	RCP 8.5M	0.33	0.33	0.33
	RCP 8.5H+	0.51	0.51	0.51
SLR 2130 (m)	RCP 2.6	0.28	0.28	0.28
	RCP 4.5	0.42	0.42	0.42
	RCP 8.5M	0.85	0.85	0.85
	RCP 8.5H+	1.17	1.17	1.17

[1]Cliff projection method has been used, so distance to future cliff toe position has been tabulated. Actual CEHZ width will be greater depending on cliff height and stable slope angle.
[2]CEHZ0 included behind coastal protection structure



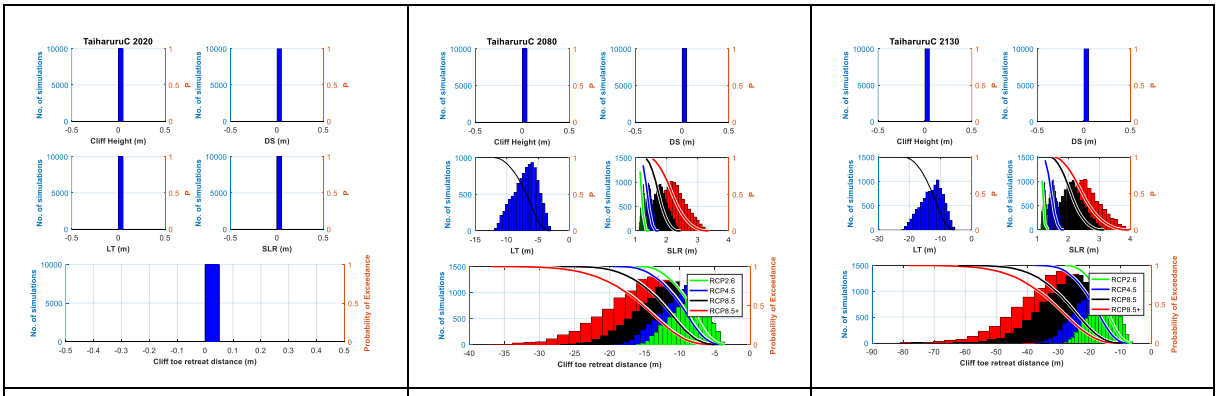
2020	2080	2130

Figure 7-1 Histograms of parameter samples and the resultant shoreline distances for 2020, 2080 and 2130 timeframes for cell 7A



2020	2080	2130

Figure 7-2 Histograms of parameter samples and the resultant shoreline distances for 2020, 2080 and 2130 timeframes for cell 7B



2020	2080	2130

Figure 7-3 Histograms of parameter samples and the resultant shoreline distances for 2020, 2080 and 2130 timeframes for cell 7C

Table 7-2 Coastal Erosion Hazard Zone Widths for 2020

Site		7. Taiharuru		
Probability of CEHZ (m) Exceedance		A*	B	C*
	Min	0	-9	0
	99%	0	-10	0
	95%	0	-11	0
	90%	0	-11	0
	80%	0	-12	0
	70%	0	-13	0
	66%	0	-13	0
	60%	0	-14	0
	50%	0	-14	0
	40%	0	-15	0
	33%	0	-15	0
	30%	0	-15	0
	20%	0	-16	0
	10%	0	-17	0
	5%	0	-18	0
	1%	0	-18	0
	Max	0	-20	0

*Cliff projection method has been used, so cliff toe position has been tabulated, which has been assumed to be unchanged from the adopted 2019 baseline. Actual CEHZ width will be greater depending on cliff height and stable slope angle.

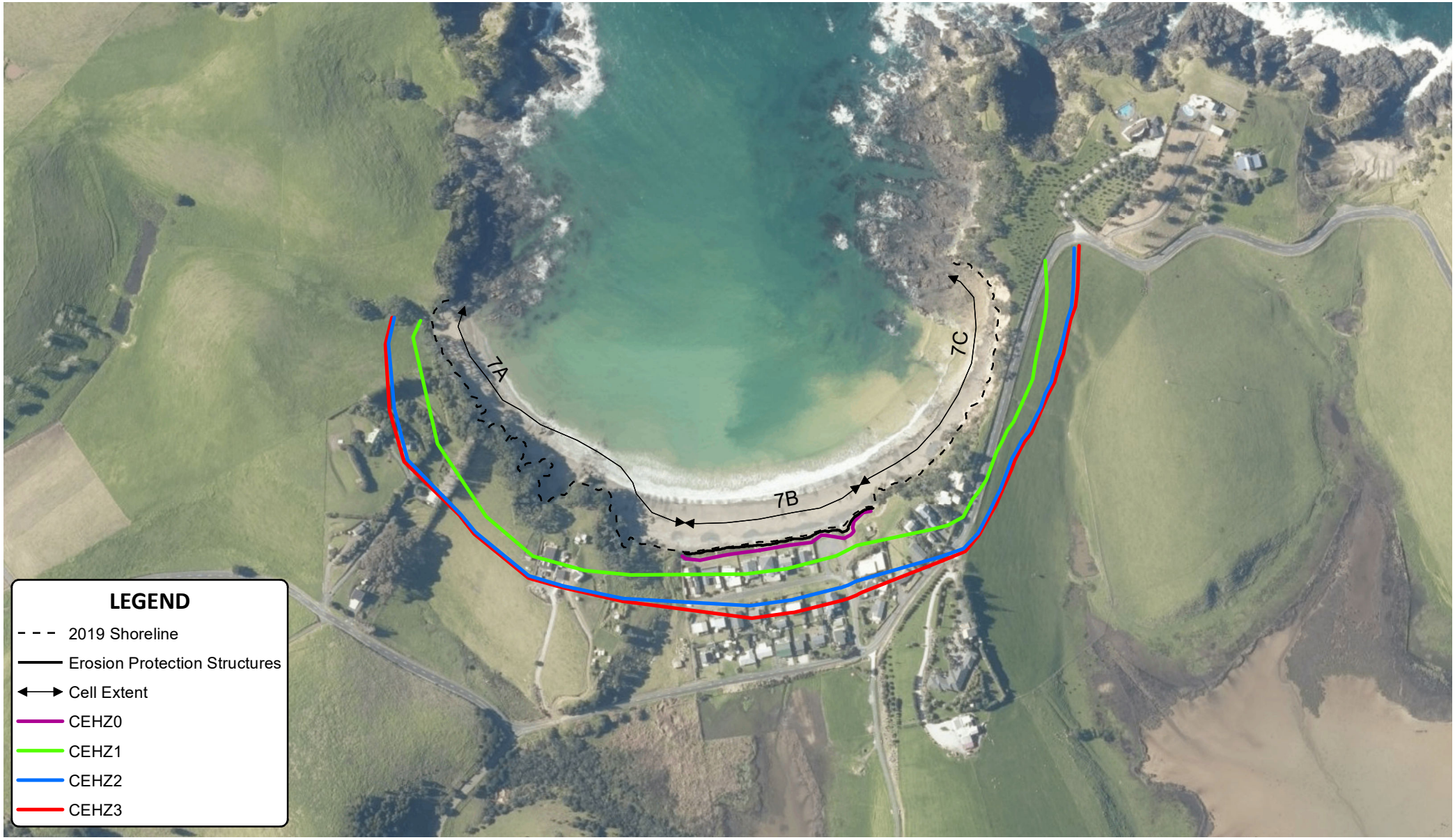
Table 7-3 Coastal Erosion Hazard Zone Widths Projected for 2080

Site		7. Taiharuru											
Cell		7A				7B				7C			
RCP scenario		2.6	4.6	8.5	8.5+	2.6	4.6	8.5	8.5+	2.6	4.6	8.5	8.5+
Probability of CEHZ (m) Exceedance	Min	-3	-4	-4	-4	-15	-16	-20	-25	-3	-4	-4	-4
	99%	-4	-4	-5	-5	-17	-19	-22	-28	-4	-4	-5	-6
	95%	-5	-5	-6	-6	-19	-21	-24	-30	-5	-5	-6	-7
	90%	-5	-5	-6	-7	-20	-22	-25	-31	-5	-6	-7	-8
	80%	-6	-6	-7	-8	-21	-23	-27	-32	-6	-7	-8	-9
	70%	-6	-7	-8	-9	-22	-24	-28	-34	-7	-7	-8	-10
	66%	-6	-7	-8	-9	-22	-24	-28	-34	-7	-8	-9	-10
	60%	-7	-7	-8	-9	-23	-24	-28	-34	-7	-8	-9	-10
	50%	-7	-7	-9	-10	-23	-25	-29	-35	-8	-9	-10	-11
	40%	-7	-8	-9	-10	-24	-26	-30	-36	-8	-9	-11	-12
	33%	-8	-8	-9	-11	-25	-27	-31	-37	-9	-10	-11	-13
	30%	-8	-8	-10	-11	-25	-27	-31	-37	-9	-10	-11	-13
	20%	-8	-9	-10	-12	-26	-28	-32	-38	-10	-11	-12	-14
	10%	-9	-10	-11	-13	-27	-29	-33	-40	-11	-12	-14	-16
	5%	-9	-10	-12	-13	-28	-30	-34	-41	-12	-13	-15	-17
	1%	-10	-11	-13	-15	-30	-32	-36	-43	-13	-14	-16	-19
	Max	-10	-12	-14	-16	-34	-36	-41	-48	-14	-15	-18	-21
	CEHZ1	-8*				-28				-9*			

*Cliff projection method has been used, so distance to future cliff toe position has been tabulated. Actual CEHZ width will be greater depending on cliff height and stable slope angle.

Table 7-4 Coastal Erosion Hazard Zone Widths Projected for 2130

Site		7. Taiharuru											
Cell		7A				7B				7C			
RCP scenario		2.6	4.6	8.5	8.5+	2.6	4.6	8.5	8.5+	2.6	4.6	8.5	8.5+
Probability of CEHZ (m) Exceedance	Min	-6	-7	-8	-9	-19	-23	-36	-45	-6	-7	-8	-8
	99%	-7	-8	-10	-11	-22	-27	-39	-49	-7	-8	-10	-11
	95%	-8	-9	-11	-12	-25	-29	-42	-52	-9	-10	-12	-13
	90%	-9	-10	-12	-14	-26	-30	-44	-54	-9	-11	-13	-15
	80%	-10	-11	-14	-15	-27	-32	-46	-56	-11	-12	-15	-17
	70%	-11	-12	-15	-17	-28	-33	-47	-58	-12	-14	-17	-18
	66%	-11	-13	-16	-17	-29	-34	-48	-58	-12	-14	-17	-19
	60%	-12	-13	-16	-18	-30	-34	-49	-59	-13	-15	-18	-20
	50%	-12	-14	-17	-19	-31	-35	-50	-61	-14	-16	-20	-22
	40%	-13	-15	-18	-20	-32	-36	-51	-62	-15	-17	-21	-23
	33%	-14	-15	-19	-21	-33	-37	-52	-63	-16	-18	-23	-25
	30%	-14	-16	-19	-21	-33	-38	-52	-64	-17	-19	-23	-25
	20%	-15	-17	-21	-23	-34	-39	-54	-65	-18	-20	-25	-28
	10%	-16	-18	-22	-25	-36	-41	-56	-68	-20	-23	-28	-31
	5%	-17	-19	-24	-26	-38	-43	-58	-70	-22	-24	-30	-34
	1%	-18	-20	-26	-29	-40	-45	-61	-74	-23	-27	-34	-38
	Max	-19	-22	-29	-33	-45	-51	-68	-81	-25	-29	-38	-43
	CEHZ2	-24*				-58*				-30*			
	CEHZ3	-26*				-70*				-34*			



Notes: Dashed CEHZ indicates greater uncertainty around stream mouths and backshore topography.
Northland 0.4m Rural Aerial Photos (2014-2016).

A4 SCALE 1:5,000

0 0.1 0.2 (km)

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Coastal Erosion Hazard Assessment
Taiharuru Bay
Site: 7

FIGURE No. Figure 7-4

Rev. 1

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Notes: Dashed CEHZ indicates greater uncertainty around stream mouths and backshore topography.
Northland 0.4m Rural Aerial Photos (2014-2016).

A4 SCALE 1:5,000

0 0.1 0.2 (km)

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Historic Shorelines
Taiharuru Bay
Site: 7

FIGURE No. Figure 7-5

Rev. 1

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